Name: _____ Integrated Geometry

Due: Thursday, September 6, 2018 – Write answers on a separate sheet of paper for each question. You must show all work for each question. Answers will be given on the first day of class. You will have a quiz on this information during the first week of school.

A. Simplify the following expressions

1. $6(x-3)^2+(4x-5)(x+7)$	2. $\sqrt{(x-3)^2+(x+6)^2}$ *(Hint: Expand the factors)*
3. $\frac{4x}{\sqrt{64x^2}}$	4. $\frac{\sqrt{3}+3\sqrt{5}}{2\sqrt{8}}$
5. $\frac{x-2}{x^2+5x+4}-\frac{8}{x^2+12x+32}$ *(Hint: Factor)*	6. $\frac{49-x^2}{-9x+14}\div\frac{x^2+2x-35}{6-3x}$

B. Solve the following equations.

1. $\frac{1}{2}+\frac{3}{x}-\frac{1}{x^2}=\frac{1}{4x}+\frac{1}{2x^2}$	2. $\frac{4}{x^2+4x-12}+\frac{x-1}{x+6}=\frac{1}{x-2}$
3. $\frac{p+5}{p^2+p}=\frac{1}{p^2+p}-\frac{p-6}{p+1}$	4. $3x^2-34x-24=0$

C. Factor each expression completely.

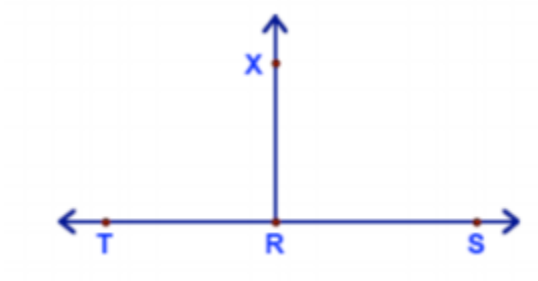
1. $3x^3-48x$	2. $3x^2-5x+2$
3. $105n^3+175n^2-75n-125$	4. $12bc-4bd-15xc+5xd$

D. Distance and Midpoint (leave answers in simplest radical form)

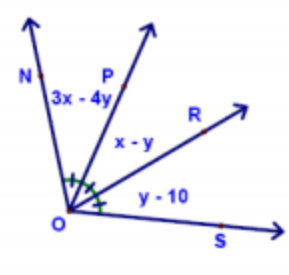
1. Find the distance between the points $(5,9)$ and $(-7,-7)$	2. Find the midpoint between (5,9) and (-7,-7)
3. Find the distance between the points $P,(w-2n,e+f)$ and $Q(w+n,e-2f)$.	4. Find the midpoint of $(\sqrt{8},-\sqrt{12})$ and $(3\sqrt{2},7\sqrt{3})$.

E. Angle relationships

1. Given $\angle TRS$ is a straight angle, $\angle TRX$ is a right angle, $m\angle TRS = 2x + 5y,\ m\angle TRX = 3x + 3y$. Solve for x and y.

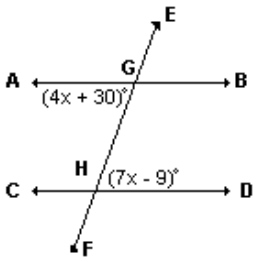


2. Given $\angle NOP \cong \angle POR \cong \angle ROS$, $\angle NOP = 3x - 4y$, $\angle POR = x - y$, and $\angle ROS = y - 10$. Find the $m\angle ROS$



3. Angle 1 and angle 2 are supplementary. $m\angle 1 = x^2 + 37$ and $m\angle 2 = 8x + 78$. Find $m\angle 1$

4. In the diagram, parallel lines $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ are intersected by transversal $\overleftrightarrow{EF}$ at *G* and *H*, respectively. If $m\angle AGH = 4x + 30$ and $m\angle GHD = 7x - 9$, what is the value of *x*?



F. Parallel and Perpendicular Lines

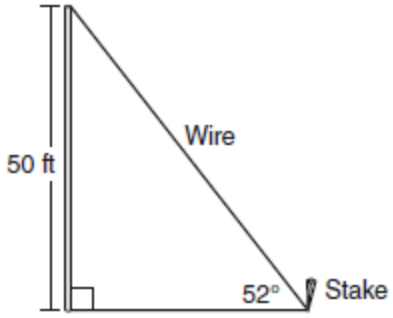
1. Write an equation of a line parallel to the line $y = \frac{3}{4}x - 6$ and having the *y*-intercept of $(0, -2)$.

2. Write an equation of a line perpendicular to the line $y = \frac{-1}{2}x + 8$ and passing through the point $(0, 1)$ in point slope form.

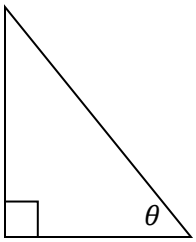
3. Write the equation of a line that is perpendicular to the line $y = \frac{1}{2}x + 3$ and passes through the point (1, 5) in point slope form.

G. Trigonometry

1. A stake is to be driven into the ground away from the base of a 50-foot pole, as shown in the diagram below. How far away from the base of the pole should the stake be driven in, to the *nearest foot*?



2. If $\cos\theta = \frac{4}{5}$, find $\sin\theta$ and $\tan\theta$.



3. Scott, whose eye level is 1.5 m above the ground, stands 30 m from a tree. The angle of elevation of a bird at the top of the tree is 36°. How far above ground is the bird?

4. A ship on the ocean surface detects a sunken on the ocean floor at an angle of depression of 50 degrees. The distance between the ship on the surface and the sunken ship on the ocean floor is 200 meters. If the ocean floor is level in this area, how far above the ocean floor, to the nearest meter, is the ship on the surface?

H. Unit Conversions – Round to the nearest tenth if necessary

1. 60 miles per hours into meters per second

2. 130 meters per second into miles per hour

3. 53 yards per hour into inches per week

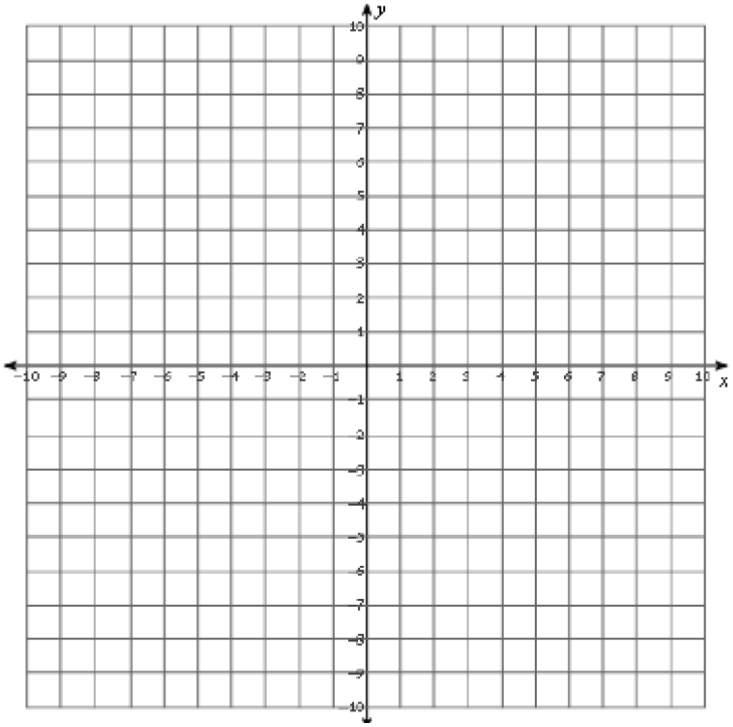
4. 12080 gallons per month into liters per hour (Assume there are 30 days in a month)

I. Equation of a Circle

1. Write the equation of circle K whose diameter has endpoints A(5,4) and B(1,-8).

2. Write the equation of the circle and identify the center and radius.
$x^2 + 4x + y^2 - 6y = -12$

3. Given the equation $x^2 + y^2 + 6x - 6y + 6 = 0$
   a) Write each equation in center-radius form.
   b) State the coordinates of the center.
   c) State the radius of the circle.
   d) Graph the circle.



J. Transformations

1. The vertices of ΔRST are R(1,1,), S(6,3) and T(2,5).

   a) Find the coordinates of $\Delta R'S'T'$ under the composition $r_{x-axis} \circ r_{y-axis}$.
   b) For what single transformation is the image the same as part a?

2. The vertices of ΔABC are A(1,2), B(5,3) and C(3,4). Find the coordinates of ΔABC under $T_{0,-4} \circ r_{y-axis}$